Regional HOT Lanes Network Feasibility Study

Phase 2, Task 10.1 – COMPARISON OF CAPITAL AND OPERATING & MAINTENANCE COST ESTIMATES FOR I-680

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and

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Introduction

PB compared capital cost estimates for the I-680 HOT lane (14.2 miles southbound from Calaveras to SR 84 in Alameda County) prepared by the ACCMA consultant team and those developed by PB using the same method as used for the overall network in Phase 1. ACCMA's estimates are based on greater project detail and greater depth of engineering than applied in the Phase 1 regional network review. The method used in Phase 1 involved consideration of corridor characteristics based on either a Project Study Report (where available) or an engineer's review of a corridor using GoogleEarth aerial photography and low, medium, or high costs depending on presence of structures needing to be modified and other factors.

In Phase 1, PB used ACCMA's capital cost estimates for the I-680 southbound HOT Lane based on ACCMA's greater level of engineering at that stage. For this Phase 2 review, the key capital cost questions are whether the regional capital costing approach produces results similar to those of ACCMA and, to the extent there are differences, what characterizes them.

In this review, PB considered I-680 capital costs developed by ACCMA's consulting team through June 14, 2007. These costs are listed in Table 1 alongside estimates made by the PB team.

PB reviewed the corridor using GoogleEarth as was done for other corridors in Phase 1. This review took into account cost estimates developed for other corridors (including I-680 northbound) and considered the same factors as included in Phase 1. The capital cost estimate for the southbound lanes of I-680 from Calaveras to SR84 was developed using the mid-range unit cost based on the inspection of Google Earth photos. This unit cost includes 30% contingencies and structure widening.

The resulting costs in 2006 $s were compared side by side with the ACCMA cost estimate as shown in table 1. ACCMA's escalation costs were not included for the capital costs, support costs or electronic toll system so that all costs could be kept in 2006 $s. In addition the risk contingency and the funds for first year operating reserve were deducted from the electronic toll system costs in ACCMA's estimate.

As shown in tables 2 and 3, a further adjustment was the reclassification of $2.53 million in ACCMA-estimated costs for centralized tolling services, essentially functions associated with BATA. These centralized tolling services costs include:

- ETS software

- Documentation
- Test bench simulator
- ETS contract project management
- Contingency associated with these costs

Clearly, such investments will be needed. However, to keep the capital cost basis similar to Phase 1 costing, these items are assumed to be spread across all corridors and are not considered to be "capital costs." The centralized services costs were estimated in Phase 1 to include: 1) $1 million in BATA start-up for HOT lane tolling; 2) the cost to BATA for processing a tolling transaction, estimated to be $0.16 per transaction; (i.e., charging a toll); 3) 2.2% of transaction costs for bank or financial institution processing fees; and, 4) $18 each for purchase and replacement of a transponder. These costs are included later in this working paper under the section on centralized services costs.

Based on these assumptions, the total capital cost estimates from the two approaches are similar ($26.3 million for the regional network approach and $24.0 million for the ACCMA project estimate).

Roadway costs are very similar under the two approaches ($12.1 million for the regional approach and $12.9 for ACCMA).

The regional network approach leads to higher structures modification costs than did ACCMA's assessment ($4.2 million vs. $1.9 million). This difference represents the preliminary estimates used in the regional approach compared with the greater depth of engineering applied by ACCMA which reflects a more detailed understanding of corridor conditions.

ITS elements (electronic toll collection and related elements) under the regional approach are estimated to be lower than the more detailed ACCMA assessment (when the centralized services costs are excluded). The regional approach yields an estimate of $4.2 million whereas the ACCMA estimate is $6.1 million.

Contingency and supplemental work shown for the regional network approach is about twice the level estimated for the ACCMA assessment. This reflects a greater contingency considered in the regional network approach.

Estimates of support costs (right-of-way engineering, PS&E, and construction engineering) differ with the regional network estimate at $5.1 million (or approximately 20% of the capital costs) and ACCMA's estimate at $7.9 million (or approximately 30% of the capital costs).

Considered together, the contingency plus supplemental work and the support costs are similar under the two approaches ($10.9 million for the regional network approach and $10.8 million for the ACCMA approach).

With centralized services costs removed from the ACCMA capital cost estimates, the regional approach capital cost estimate and the ACCMA capital cost estimate are within 2% of each other. With ACCMA's (adjusted) capital cost very close to the regional approach estimate, this suggests that the regional approach is producing estimates that are reasonable. While having a greater contingency allowance in the regional estimates would be preferable, the comparison suggests that the regional estimates are acceptable for this stage of the analysis.

ACCMA's consultants advised MTC and PB on June 14, 2007 that they believed their contingency estimate could be reduced given the advanced stage of engineering. If that were to be done, the ACCMA (adjusted) capital costs would be lower than shown above, thus suggesting that the regional approach is providing a comparable capital cost and building in a slight contingency representing a measure of conservativeness in the regional estimates.

However, this overall review suggested to the PB team that the MTC unit costs should be increased by 10% to provide for greater contingency. With Caltrans' concurrence and request for an additional 10% increase, the Phase 1 unit costs were increased by 20% for the Phase 2 working papers.

Table 1: Unit Cost Comparison-Southbound I-680 HOT Lane in Alameda County (In 2006 $s)

Item	Regional HOT Lane Feasibility Project Estimates (Based on Medium Range Cost Assumption)		ACCMA I-680 SB Cost Estimate (Source: ACCMA I-680 cost estimates)	
	Total Cost	Comments	Total Cost	Comments
Roadway Costs	$ 12,102,112		$ 12,876,827	Northern Segment Roadway, Southern Segment Roadway
Structure Modification	$ 4,200,000		$ 1,851,360	Northern Segment Structures
ITS Elements	$ 4,200,000		$ 6,067,688	System Integrator, Systems Engineering (not including escalation or risk contingency *and not including centralized system costs -- see tables 2 and 3 below*)
Contingency & Supplemental Work	$ 5,846,610	30%	$ 2,892,831	Northern Segment Contingency and Supplemental Work, Southern Segment Contingency
Right of Way Capital	$ -	included in contingencies	$ 352,800	Right of Way Capital
Total Capital Costs	**$ 26,348,722**		**$ 24,041,506**	
Total Support Costs RWE, PS&E, CE	$ 5,067,062	20% of total	$ 7,915,942	PS&E and CE for Smart Share of HOV PS&E; Scoping, PE/ENV, PS&E, CE, and Contingency for HOT Lane PS&E
Grand Total	**$ 31,415,784**		**$ 31,957,448**	

Table 2: ACCMA ITS Costs Likely Associated with BATA Centralized System		
ETS Software	$	1,440,000
Documentation	$	200,000
Test Bench Simulator	$	37,500
ETS Contract Project Management	$	350,000
Subtotal	*$*	*2,027,500*
25% Contingency	$	506,875
Total	**$**	**2,534,375**

Table 3: Adjustment of ACCMA ITS Costs to Remove Centralized System Costs		
ACCMA ITS Costs	$	8,602,063
Less centralized system (BATA-type) costs	$	(2,534,375)
ITS costs apportionable to corridor (and entered in "ITS Elements" costs above)	**$**	**6,067,688**

Operations and Maintenance Costs

The PB team considered the O&M costs developed by ACCMA and concluded that with greater depth of review having been completed by ACCMA, it would be appropriate to adapt that project's O&M estimate for the regional assessment. The team rounded the per mile cost to $70,000 per lane mile per year.

Operations and Maintenance Elements	ACCMA Estimated Cost Per Lane Mile	O&M Estimate Used for MTC HOT Lane Assessment
Administration and marketing	$28,520	
Oversight and reporting	$ 5,280	
Violation enforcement by CHP	$16,900	
Toll equipment maintenance	$15,490	
Total	$66,190	$70,000